Development and Innovation of Renewable Energy in China

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Outline

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1 Overview of State Grid Corporation of China

2 Development of Renewable Energy in China

3 Challenges of Renewable Energy

4 Proposed Solution

1. 1 SGCC Overview

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■ **Geographic Coverage**

88% of China's territory

■ **Customers**

Serving over 1.1 billion population,

■ **Employee**

1.87 million

■ **Key Figures (2014)**

Assets: ***$474.1Bn***, Revenue ***$338.1Bn***

■ **Core business**

Power grid construction and operation, R&D

■ **Overseas business**

Runs overseas business in the Philippines, Portugal, Brazil, Australia,Italy,etc.

■ **Ranked 7th Fortune Global 500**

2.1 Large-scale Renewable Energy in China

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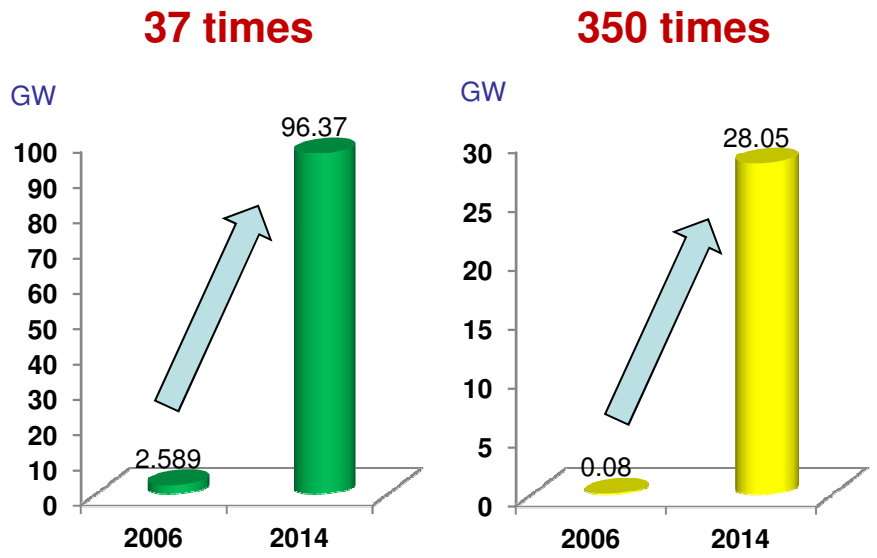
- **Hydro power : 290 GW, ranking No.1 in the world;**
- **Wind power : 91.42 GW, ranking No.1 in the world;**
- **PV power : 18.1GW, ranking No.2 in the world;**
- **Wind power has been the third biggest power source in China.**



Wind and PV power capacity growth from 2006 to 2014

2.2 Large-scale Renewable Energy in China

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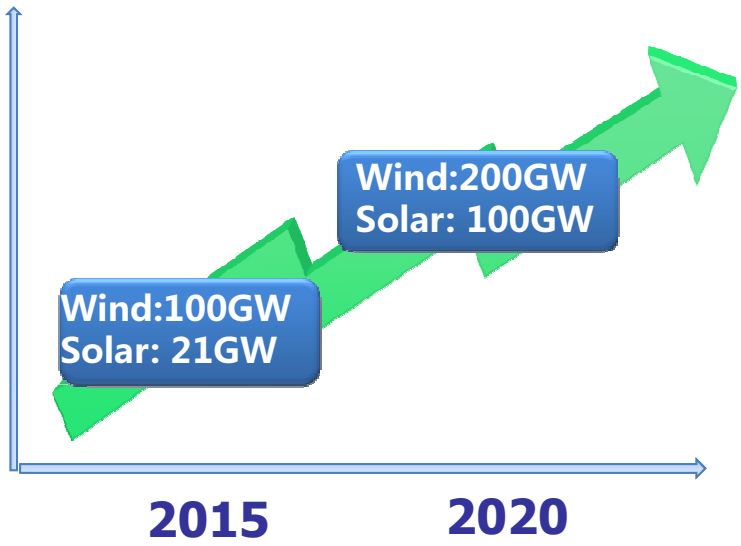
- **8 large-scale wind power bases are in plan and construction, each of them is with the capacity of more than 10GW.**



Wind,Solar,Storage Pilot Project

Wind： 600MW

Solar: 60MW

Storage: 50MW

2.4 UHV Power Transmission in China

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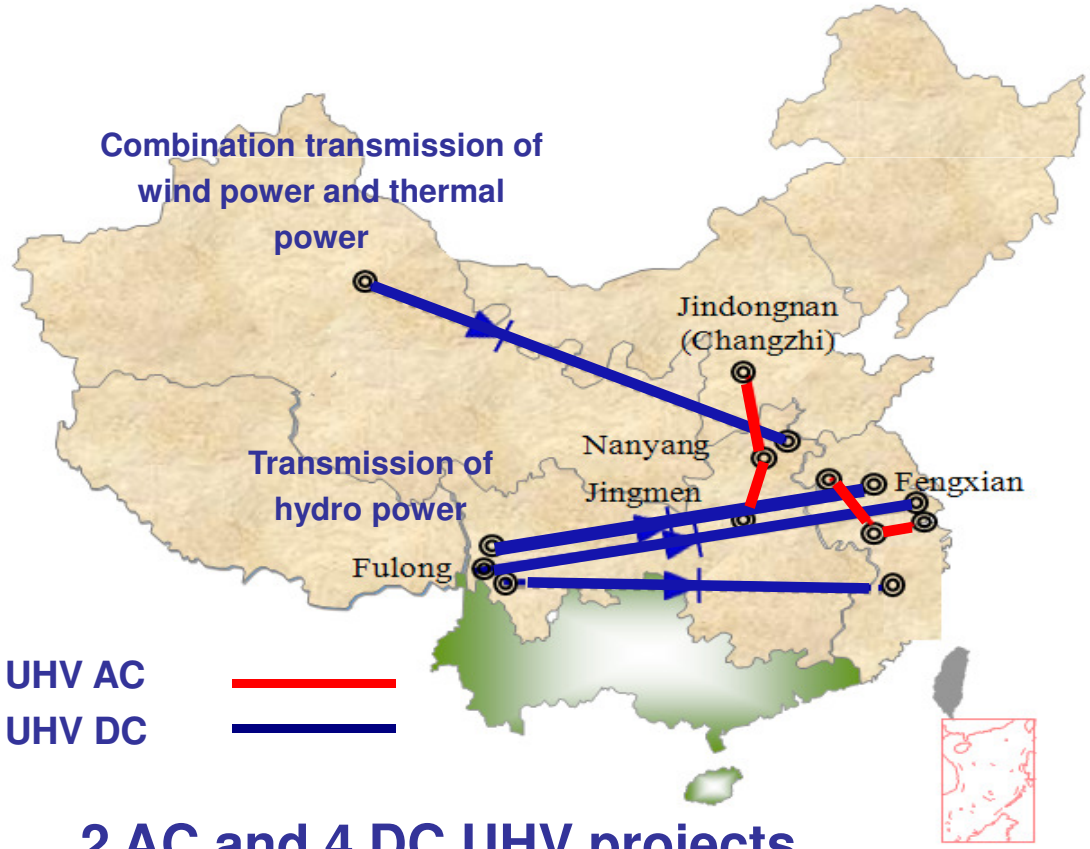
◆ Engineering construction:

- ➢ Completed 2 AC and 4 DC UHV projects
- ➢ Delivered over 200TWh electricity in total



2 AC and 4 DC UHV projects

Commissioned UHV projects

Projects	Length of line	Conversion capacity	AnnualCO2 emission reduction
1000kV Jindongnan--Jimen	640km	18GVA	--
±800kV Xiangjiaba-Shanghai	1,907km	12.8GW	26.0 million tons
±800kV Jinping-Sunan	2,059km	14.4GW	32.4 million tons
1000kV Huainan-Zhebei-Shanghai	2×649km	21GVA	--
±800kV Haminan-Zhengzhou	2,210km	16GW	40 million tons
±800kV Xiluodu-Zhexi	1,669km	16GW	34.0 million tons
Total	9,782km	98.20G	132.4 million tons

2.5 UHV Power Transmission in Future

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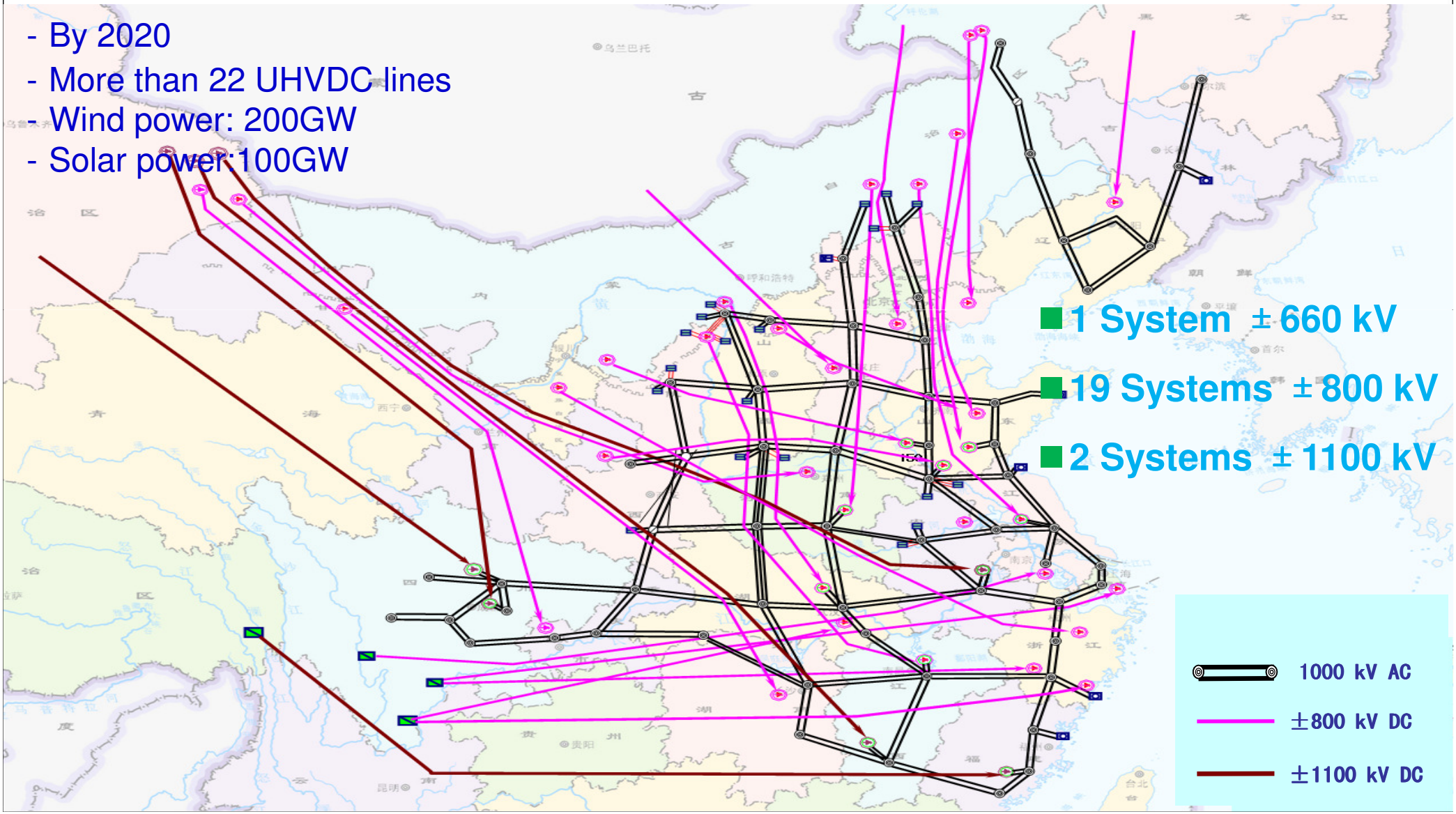
- By 2020
- More than 22 UHVDC lines
- Wind power: 200GW
- Solar power:100GW



3 Challenge

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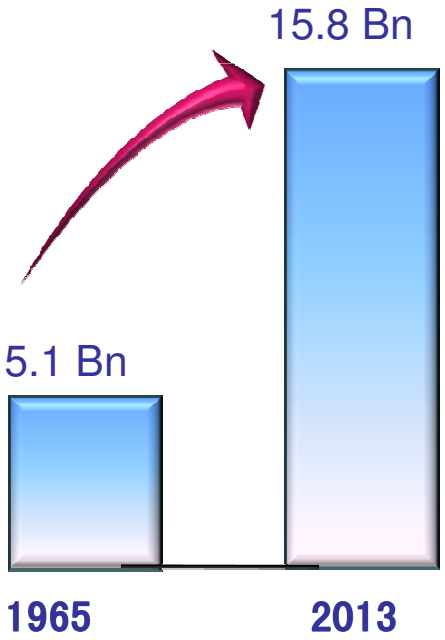
Fossil Energy: Environmental pollution & Climate changes

- Fossil Energy: Carbon dioxide Emissions: **73.8%**
- By end of 21 century CO2 will reach to **450ppm** and Global temperature will increase over **4℃** if nothing will be done.



Global Fossil Energy consumption
（Coal in Ton ）

Smokes in London

Hazes in Beijing

4.1 Proposed solution

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- **Clean replacement:** to replace fossil energy with clean energy for energy development, embark on a low-carbon and green development path
- **Electricity replacement:** to replace coal and oil by electricity in consumption and raise the share of electric energy in end consumption, thus reducing fossil energy consumption and environment pollution.

Resource	Quantity
Hydro power	5,000 GW+
Onshore wind	1000TW+
Solar	100,000 TW

Total hydro, wind and solar energy in the world

4.2 Proposed solution

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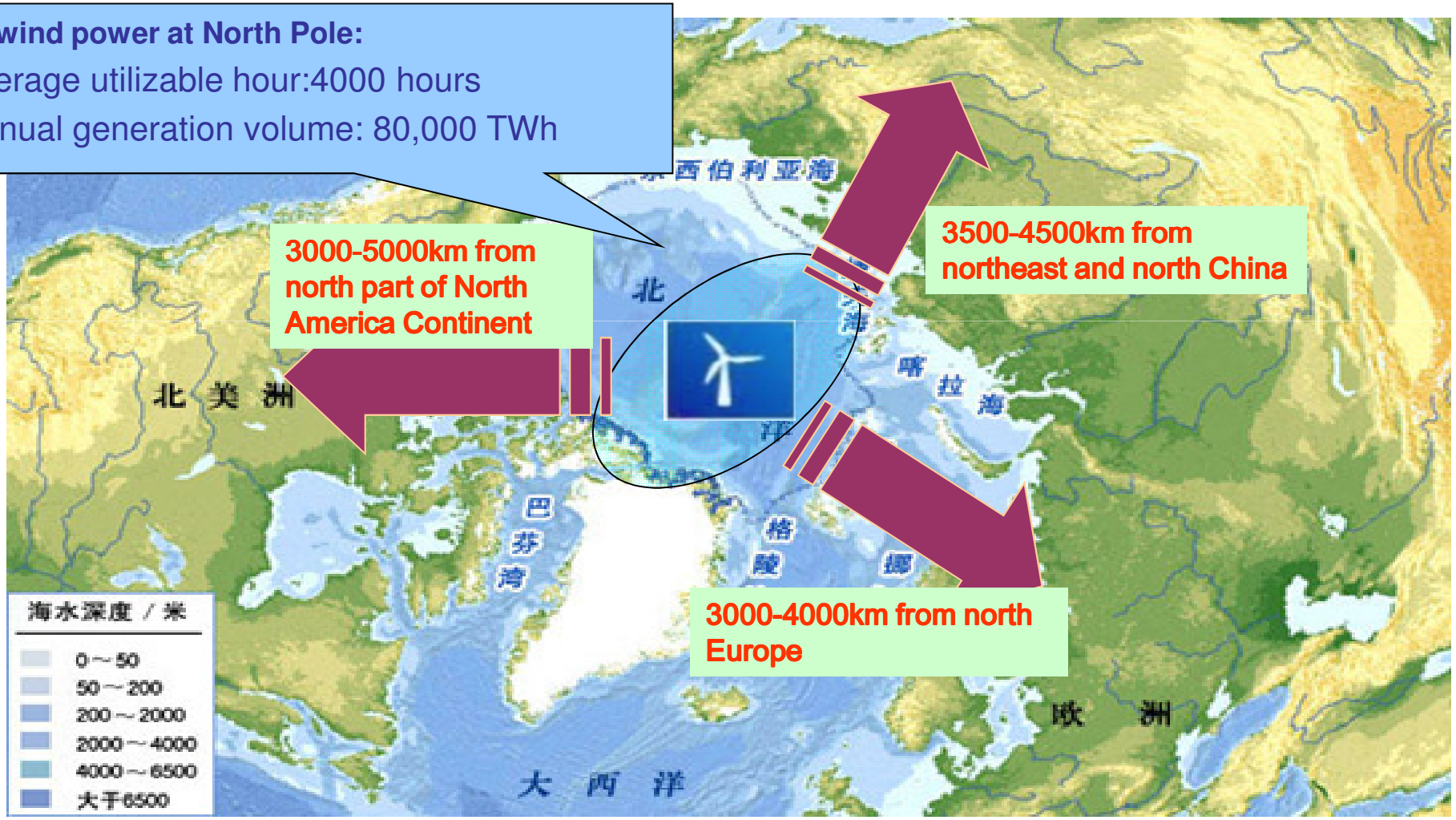
Vision for North Pole Intercontinental Transmission Highway

Rich wind power at North Pole:

- Average utilizable hour:4000 hours
- Annual generation volume: 80,000 TWh



4.3 Proposed solution

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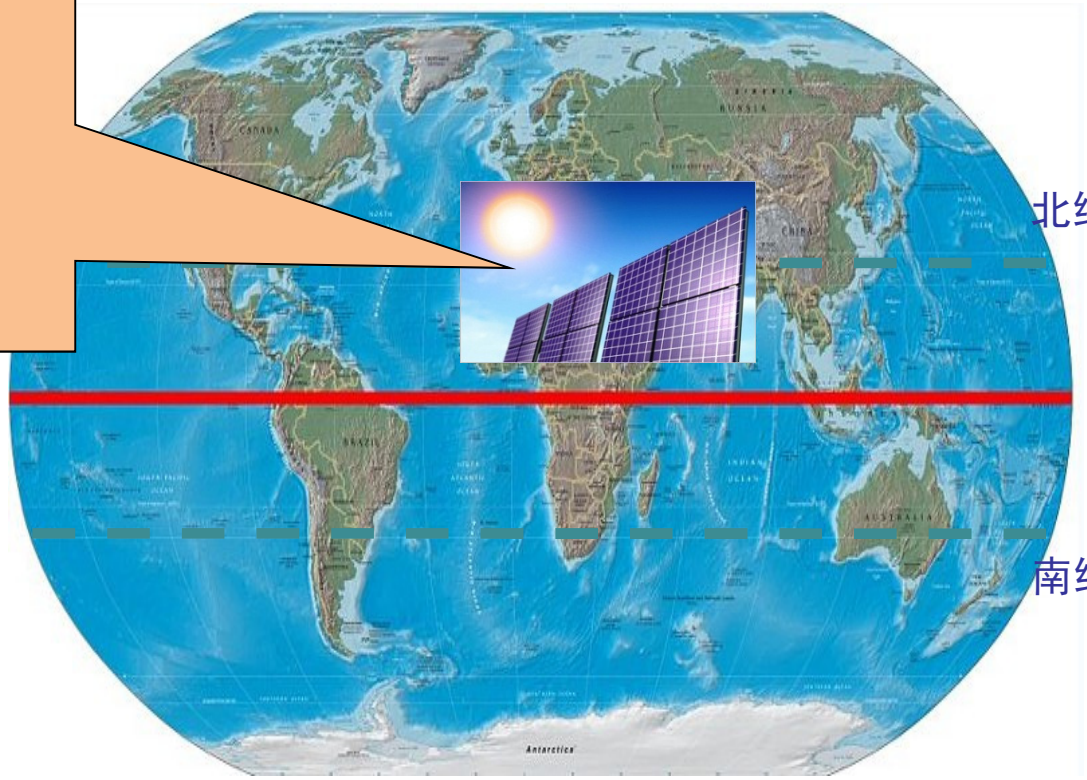
Exploitable Solar Energy in Equatorial belt Area

(Annual generation volume)

- **Noth Africa:** 27,000 TWh
- **Middle East:** 9,000 TWh
- **Australia:** 15,000 TWh
- **Norh America:** 5,000 TWh



4.4 Global Energy Interconnection

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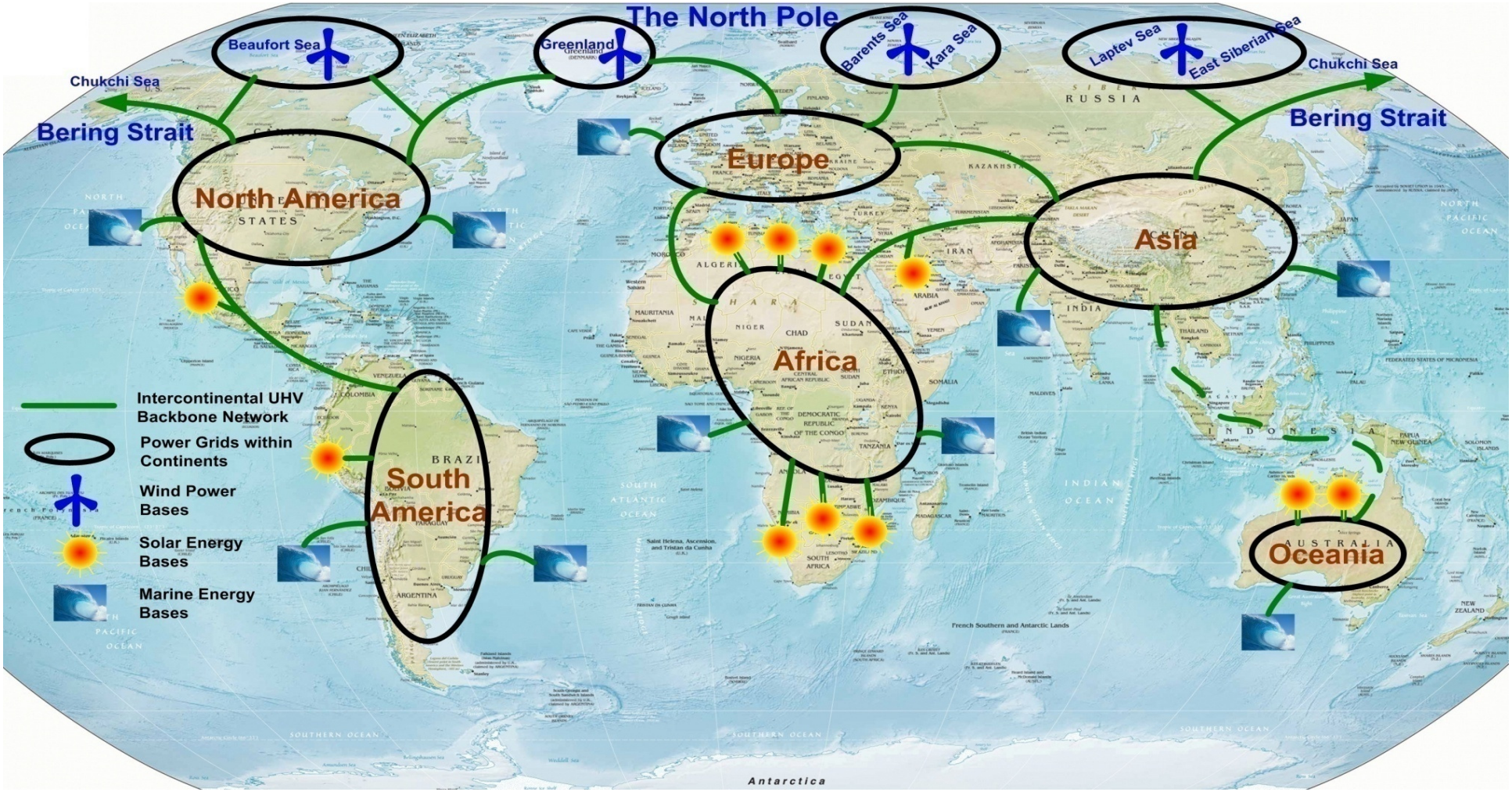

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